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ABSTRACT

The resource guide to the early educational treatment of handicapped infants (from birth to 3 years) reviews research providing a rationale for early intervention, compares four common treatment models, examines approximately 40 global or specific curriculums, evaluates appropriate materials and toys, and notes three sources of information on personnel training. Research is reviewed which supports the value of early enrichment, the existence of critical periods for learning, and the lasting effects of early stimulation. Described are four models of infant education: center programs, tutorial programs, home-visit programs, and programs which train groups of parents in intervention techniques. Discussed are curriculum guides for deprived children, children with gross motor involvement, and children with visual and/or aural handicaps. Listed under materials are commercial companies and guides to making infant toys. Personnel training manuals for the various program models are evaluated. A bibliography lists approximately 130 references. (DB)

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A RESOURCE GUIDE TO THE VERY EARLY TREATMENT OF HANDICAPPED INFANTS

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ABSTRACT

The need for a resource guide to the early treatment of handicapped infants has become apparent as a result of the increased interest in early intervention with children from birth to age three years. This paper presents a guide to the rationale for early intervention; program models for infant projects; and the available curriculums that can be used with exceptional infants. Emphasis is placed on program content and treatment procedures. References to infant materials and personnel training are also presented.

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A RESOURCE GUIDE TO THE VERY EARLY TREATMENT OF HANDICAPPED INFANTS

Recent years have seen the development of a large number of early intervention programs for both culturally disadvantaged and exceptional children in the age range from birth to three years. The rationale for this early intervention has been dealt with by Caldwell (1970, 1971), using both inferential and empirical research findings. Butler (1970) and Grotberg (1971) have reviewed the variety of models being used for these intervention programs in an attempt to give decision-making assistance for those interested in infant project planning. A major neglected area however, has been the program content or curricula of these infant programs. For those of us interested in the early treatment of exceptional infants, the approaches used with culturally deprived infants fall short of what is required for handicapped children. What is needed, in addition to the basic cognitive, language, etc. curriculums, are additional methods specific to each childs particular involvement. Although the methods and materials described in this paper are applicable to culturally deprived infants, the major emphasis is on the exceptional infant with particular reference to specific deficit areas.

THE PURPOSE of this paper is to present a resource guide for those interested in early intervention with handicapped infants. What is described is (1) an overview of the rationale for early intervention; (2) a brief description of the models being used in infant programs; and (3) a detailed presentation of the available resource materials concerning the methods, materials, and techniques applicable for early intervention with exceptional infants.

THE RATIONALE

According to Caldwell (1970, 1971), the rationale for early intervention is based on both inferential and empirical research findings. The inferential rationale has been generated from the studies of the effects of early experiences on animals; the studies of children reared in "deprived" environments; and the conceptual analysis of early development as described by a number of scholars. The emperical rationale according to Caldwell (1970) has been the result of two major studies; one by Skeels and Dye (1939), the other by Kirk (1958).

The rationale based on the animal research has occured along three lines of inquiry: that of deprivation, that of extra stimulation, and that of timing effects and critical periods. Beach and Jaynes (1954), in a review of the literature on the effects of early experiences on the behavior of animals, found that for the most part early experiences had marked effects on adult behavior. For example, Sackett (1965) found that infant monkeys reared under conditions of social isolation and perceptual impoverishment became inactive and displayed a minimal amount of exploratory behavior. In studies of isolate reared monkeys, Harlow and Harlow (1962, 1969) found that those infants raised under deprivation became socially unresponsive adults and that the females often became brutal towards their offspring. In terms of learning abilities, however, this early deprivation appeared to have little or no effect (Mason and FitzGerald, 1964; Sackett, 1965). Another approach to deprivation has been that of restricting the use of specific perceptual areas. In a number of studies; Chow and Nissen (1955),

Fox, Inman, and Glissen (1968), Riesen, Kurke, and Meeinger (1953), depriving chimpanzees, dogs, and kittens, respectively, of visual stimulation found that all their subjects had difficulty in later functioning abilities. With regards to coordinating functions, Held and Bauer (1967) found that infant monkeys deprived of eye-hand coordination practices impaired later visually-directed reaching. All in all, the majority of deprivation studies with animals show convincing evidence that such early experiences do have damaging effects on later abilities.

On the other hand, studies of the enrichment of the environments of animals have shown positive effects. Wachs and Cucinotta (1971), in a report on the lasting effects of neonatal stimulation, identified four major areas in which early experiences with animals had differential results. The studies cited deal with emotionality (Denenberg, 1964; 1967); exploration (DeNelesky and Denenberg, 1967a; 1967b); animal intelligence (Hebb, 1949; Hymovitch, 1952; Schwartz, 1964); and learning (Forgus, 1958a; 1958b; Gibson and Walk, 1956; Krech, Rosenweig and Bennett, 1962; McCall and Lester, 1969; Thompson and Heron, 1954). The interesting results of the majority of these studies is that not only do these effects carry over into adulthood (Denenberg and Morton, 1962), but also that the effects often carry over to the offspring (Denenberg, 1967). The one thing that these animal studies do suggest is that some form of enriched neonatal experiences do result in improvement of behavior.

The third approach taken with animal studies is an extension of both the deprivation and enrichment studies. It has to do with the time factor; that is, to what extent do critical periods

exist when the effects of either deprivation or enrichment occur. (See Nash (1970) for an excellent review of critical periods in both animal and human research).

In deprivation studies, a number of critical periods can be indentified using animals as subjects. Dennis (1941) in restricting young buzzards just at the beginning of feathering for 10 weeks, resulted in the birds not being able to fly. Thompson and Melzack (1956) found that Scottish Terrier puppies kept in isolation for the first seven weeks of life were inferior in problem-solving abilities as compared to a control group. In social development, Elliot and Scott (1961) found that in puppies, the severest emotional reactions to seperation occurs at six to seven weeks during the period of primary socialization.

Critical periods for animals receiving extra stimulation can also be identified. Early enrichment with rats during the first 21-24 days has shown increases in problem solving abilities (Bingham and Griffiths, 1952 ; Forgays and Forgays, 1952). Denenberg (1964) found that not only the timing, but the amount of stimulation to be critical in lowering emotionality and raising learning abilities. From the studies of Beach (1966) and Hayes (1951) who enriched the environments of chimpanzees, Caldwell (1970) concluded that the animal studies suggest that the important period for manipulation of environmental experiences is during infancy.

The second inferential rationale for early intervention has been the results of studies of children raised in "deprived" environments. Since a large body of literature already exists in this area, interested readers should refer to Ainsworth (1962),

Bowbly (1951, 1965), Casler (1962), and Yarrow (1961). For the most part these studies concern themselves with institutionally reared children, primarily being deprived of environmental and parental stimulation (Nash, 1952). Nash (1970) in commenting on a number of these studies suggests that the most serious effects of these deprived environments occur when it commences early; that it is the early timing which is important for the later damaging effects. Caldwell (1970, 1971), in presenting evidence from other studies, draws the same conclusion.

The third inferential rationale is based on the conceptual analysis of early intellectual development and the effects of the environment on its growth. Probably the foremost in this area has been Piaget (1936, 1937, 1945) who, in his three volumes which cover the first two years of life (sensorimotor period), describes the development of intellectual abilities as they emerge from the newborns interaction with his environment. In terms of early intervention, it is Piaget's particular view, that all later intellectual abilities develop from the infants sensorimotor abilities that suggests a rationale for providing early experiences as a means of increasing the childs intellectual structures. Other important contributors to the importance of the infancy period have been Hebb (1949) and his theory of neurophysiology; Hunt (1961) who challenged the idea of fixed intelligence and who gave support to Piagetian theory; Bloom (1964) who through an analysis of a number of longitudinal studies concluded that a large portion of a persons intellectual abilities develop during the first four years of life; and Bruner (1960) who gave encouragement that early education could be used as a means of

changing environmental handicaps.

Caldwell (1970), in discussing the empirical rationale for early intervention, suggests that if stimulation in infancy could show lasting effects, it would be grounds enough to support early intervention. The study of Skeels and Dye (1939) showed such effects. In the study, 13 "failure to thrive" infants in a institution were placed under the care of older mentally retarded adolescent girls. After only 19 months, increases in I.Q. scores were found, with the effects lasting into adulthood (Skeels, 1966). Kirk (1958), in his own study, suggests that his subjects showed less impressive gains primarily because he began intervention later than did Skeels and Dye. This led Kirk (1958) to conclude that greater gains can be expected if intervention is begun early. Other evidence of this sort is available from the studies of Flint (1966) and Taylor (1968) who followed children placed in foster homes after an initial institutional placement. Studies like these clearly indicate the importance of the infancy period; and such has led Caldwell (1968) to state that "The first three years of a child's life represent the most important period for priming a child's cognitive, social, and emotional development....[p.79]".

MODEL CHOICE IN INFANT PROGRAMS

The obvious outgrowth of the interest in the importance of the infancy period has been the development of a large number of infant programs. For example, the Bureau of Education for the Handicapped (1971) has some 70 demonstration programs for the handicapped, many of which provide services for exceptional children in the age range from birth to three years. But since it is not the purpose here to discuss individual programs in detail, only references to such programs will be given. However, the programs cited reflect for the

most part the models being used in infant program planning.

A number of recent studies (Appalachin Regional Commission, 1970; Butler, 1970; Grotberg, 1971) have provided data on the types of infant models available. Honig (1972), in summarizing some of this data, discusses the four models that are typically used. These are the center, the tutorial, the home-visit, and the parent-group models. (See Caldwell (1971) also for a summary of the model choices in infant programs).

Center programs basically aim to provide a structured setting where the child can be given the "essentials" of enrichment. The environment is programmed in such a way as to foster social, cognitive, emotional and nutritional development. Examples of such programs can be found in Caldwell and Richmond (1964, 1968), Keister (1970), Robinson (1968) and Provence (1968).

The tutorial model is usually a home-visiting program where a child development specialist tutors the child on a one-to-one basis, usually at weekly intervals. A major shortcoming of the approach is that there is little involvement from the parents. Descriptions of this type of program can be found in Painter (1969), Schaefer (1970), and Schaefer and Aaronson (1972).

The home-visit model is one where mothers are taught how to present activities to their child, and they themselves serve as the teacher. The design emphasizes the bringing of the mother and child together through an interaction process. One of the best descriptions of such an approach can be found in Gordon's (1969) work. Other examples of such programs can be found in Levenstein (1971), Geisy (1970), and Weikart et al (1969).

The fourth approach has been to teach parents in groups with the expectation that the intervention techniques discussed will be used to effect the behavior of their child. A description of a

parent-group model can be found in Karnes et al (1968).

Briefer descriptions of the first three models can be found in Children (1969) where Gordon, Palmer, Provence and Schaefer discuss their programs.

RESOURCE MATERIALS

As mentioned in the introduction of this paper, one area of neglect in the infant literature has been the program content and the treatments that the infants receive. What is attempted in this section is a presentation of the available curriculums, resource guides and treatment procedures that are applicable for use with handicapped infants. Other resource information pertaining to materials and personnel training are also presented.

The author does not suggest that what is presented is the answer for the treatment of young handicapped infants. What is described is meant to provide resource information as a guide to curriculum development and treatment procedures. It is hoped that this guide will present a framework from which research in the area of the treatment of handicapped infants can be begun. For this reason, a number of the references cited are not curricula or treatments as such, but rather research findings that suggest, because of the nature of their results, an excellent framework from which infant activities can be developed.

Methods

A number of resource guides which are global in their approaches have been developed recently. Tilton, Liska, and Bourland (1972), in collaboration with a number of other child specialists, have edited a manual which covers activities in perceptual-motor, cognitive, language, and self-care areas (including toilet training and eating skills). Seventeen sub-areas are

defined and specific activities in a hierarchical sequence are presented. Evaluation checklists to determine each child's functioning level are available for every sub-area. This manual is probably the most comprehensive curriculum available for developmentally delayed infants. A slightly different approach to curriculum development has been attempted by Hoffman and Mottola (1971). Included in the design are language, task-oriented and experience-oriented activities. Social-emotional development and a health-nutrition program are also included. The curriculum, although developed for migrant children, has a general applicability to handicapped infants. Another source of general curriculum development can be found in the Soviet Preschool Education volumes edited by Chauncey (1969). They can be very helpful for activity suggestions in the areas of language, motor and sensory-perceptual development. Another available series of activities in language, personal-social, fine-motor, and gross-motor areas has been developed by Segner and Patterson (1970). The guide can be extremely useful as a manual for parents. In a delightful 12-part series, Edwards (1971) has described a series of growth objectives which accompany the Wonder of Growing toys developed by Sears, Roebuck & Company (see below). The growth objectives themselves provide a number of helpful insights into the appropriate use of the toys at each developmental level. Arnold (1971), although less interested in a curriculum as such, describes a wide variety of activities to "educate the senses." His suggestions are especially valuable for sensory impaired infants.

More specific curriculums can be identified in the areas of cognition and language. In an eight level series, Gordon and

Lally (1967) have developed a number of activities which are Piagetian based; with additional activities in the receptive and expressive language areas. Another series of cognitive and pre-academic activities have been developed by Gordon (1970) especially for parents. However, the activities are easily adaptable to an infancy program. Bardwell et al (1972) have developed Piagetian type infant activities covering the following areas: language, object permanence, space, means-ends, sensory perception, self concepts, prehension, locomotion, casuality and imitation. Although loosely structured, it can provide helpful ideas for program content development. Another curriculum covering the more traditional Piagetian areas has been developed by Badger (1970). It is based on the behavioral findings of Uzgiris and Hunt (1966). Painter (1968, 1971) in describing her research findings and curriculum development, presents a detailed series of activities primarily aimed at sense-perceptual stimulation. Language development and some Piagetian areas are also covered.

Research in language development has led to a number of findings which suggest procedures for developing linguistic skills. A number of studies on pre-linguistic vocalizations have shown that, through certain reinforcement schedules, the vocalization rate can be increased. Such findings have great potential in terms of language development since there is some evidence that vocalizations do predict later language abilities (Cammeron, Livson, and Bayley, 1967; Moore, 1967). The findings of the vocalization studies by Rheingold, Gerwitz and Ross (1959), Todd and Palmer (1968), and Weisberg (1963), show that if the reinforcement of the infant is contingent upon the infant's responses, the vocalization rate can be

increased. Such findings can be aianted to activities in both language and social development areas. Routh (1969), also interested in conditioning of vocal responses, found not only that he could increase vocalizations, but that infants who were reinforced for only vowel or consonent sounds tended to increase their production of the "reinforced" class (consonants or vowels) than did a group who were reinforced for any sound. Such findings may provide a means in developing procedures to shape particular words. Friedlander (1971), more interested in receptive language abilities, has developed the PLAYTEST, a two channel toy which allows the infant to choose the channel he prefers. The research findings from the PLAYTEST suggests that some infants can increase their receptive language abilities. In a twelve part series, the J. Tracey Clinic (1968) has developed a number of home activities designed to provide a language stimulating environment. The series is applicable to all infants regardless of specific involvement.

Two major programs have been developed whose primary emphasis is on language development. Levenstein (1970) used Verbal Interaction Stimulus Materials (VISM) in a home visiting program where toys were used as the means to develop language skills. The program is based on the view that verbal abilities are highly related to cognitive skills. Eight catagorizations are presented. In another program of the same viewpoint, Painter (1969) developed a training procedure where language skills are taught in the sequence : beginning language activities (imitation); elaborating language abilities; the breaking down of "giant word units" as suggested by Bereiter and Engelmann (1966); and the encouragement of internal dialogue. Examples in each of the areas is presented.

The conceptual training areas are also presented. An excellent source book of language activities has been compiled by Engel (1968). The suggestions cover a number of language areas.

Bricker and Bricker (1970) and Salzinger et al (1962) have developed operant procedures for developing receptive and expressive skills for older children. The methods, however, can be modified and applied for the age group under discussion.

Research relating to both prehension and gross motor development has provided excellent guides for the treatment of the child with a motor involvement. White, Castle, and Held (1964) and White and Held (1968) have presented an excellent recording of prehension development in the infant from birth to six months. Although materials have been developed from this research (see Playtentials below), the sequence of prehension development lends itself to a series of activities which can be developed for the child while he is still in a crib setting.

A treatment program for children who have gross motor involvements has been developed by the Bobath's (1963, 1967) to prevent abnormal postural activity, and to develop (1) the protective reflexes needed for later gross motor development, and (2) functional patterns for feeding, dressing, etc. Although well known among physical therapists, the procedures are easily adaptable to infant programs with handicapped children having gross motor problems. Frichtl and Peterson (1970) have also developed a sequence of motor activities which are primarily aimed at head control and locomotion functions. The activities are developed along a cephalocaudel model; control of body movements from head to upper trunk to lower extremities. An assessment checklist is included to determine at what level to begin the treatment.

The interventionist interested in the early treatment of the visually impaired child should refer to Bryan (n.d.) who describes methods in the self-help areas; for sitting and walking; and play activities. Holliday (n.d.) also has some very helpful suggestions for treatment of the visually impaired child. The State of Illinois (1971) has developed a series of three kits of materials specifically for the visually handicapped child from birth to age three. The list of materials and purposes of each are given for the three kits.

For those working with deaf infants in a home visiting program, refer to Horton (1968) and Knox (1968) for a description of their programs. Eary identification of deafness has been described by Downs (1968), while early remediation has been described by Ling (1968), Smullen (1970), and Harris and Weber (1967). Suggestions to parents of very young deaf infants can be found in French (1968).

For those interested in the deaf-blind infant, see Esche and Griffin (1965) for a guide to treatment in the self-help areas, motor development, speech and language, and for auditory experiences.

Finnie (1970) has described the early treatment of the cerebral palsied child covering the self-help areas, motor developement, and carrying advice. Specific suggestions are given for toilet training, feeding, and sleeping positions. The book is illustrated with examples in the areas presented. A list of special equipment and reading suggestions are also given. The book is a must for anyone working with young cerebral palsied children. For additional information concerning the treamient of cerebral palsied infants, refer to Bobath (1963, 1967).

Materials

In a presentation of available materials for infants, one needs to be selective as a result of the commerical toy manufactures jump

to get in on the baby business boom. However, some of the toys are most applicable for use with handicapped infants.

Both Creative Playthings and Childcraft have available a large selection of toys which can be of valuable use in working with handicapped infants. In the last two years, a number of toy manufactures have developed kits primarily for infants and toddlers. Sears, Roebuck and Co. has developed a 12 part series of toys for the child from birth to age three. An excellent feature of the series is that a guide suggesting growth objectives is available to accompany the use of the toys (see Edwards above). The toys can be easily adapted to use with handicapped infants. The Kenner Products Company has available a set of toys, Playtentials, which have been developed from the research of Burton White (see above) and are designed for the child to play with in a crib setting. The main objective is the development of prehension skills. A recently developed toy by Kenner has been the Touch-N-Teach toy for language development. The interesting feature of the toy is that it offers both visual and auditory feedback. A less adaptable toy series has been developed by Hasbro Industries; however, a number of the toys offer variety and variation from those already mentioned is the age range from one to two years.

Two excellent resource guides exist for making infant toys. Forrester et al (1971) describes some 40 easily made toys for infant development. The guide also includes the areas of development each toy is used for and purpose of each toy. Upchurch (1971) has developed a similar guide for easy-to-make toys. The activities for each toy is presented. Less extensive suggestions for toy selection can be found in Allen and Meterer (1963), Arnold (1955)

and A.C.E.I. (n.d.). Toys applicable for visually impaired children are described in a series by the instructional materials center, State of Illinois (1971).

Training Procedures

Resource information pertaining to personnel training has also become available in the last few years. Honig and Lally (1972) have recently described procedures for training caretakers who will be working with infants. The format of the training procedure is such that specific type behaviors are dealt with as separate topics; the aim being to build a broad reference to observing and changing infant behavior. The content areas discussed are emotional, nutritional, gross motor, fine motor, cognition, and language development. Sense experiences and the appropriate use of space are also covered. The book is applicable for training caretakers both in a center and a home visiting approach.

For those interventionists in home visiting programs, a number of training manuals exist. The process of home visiting and personnel training has been discussed by Gisey (1970). In a follow-up to this guide, Forrester et al (1971) described the approach, programming, and processes involved in the home visiting model. Both guides provide excellent training suggestions; both also include infant activities.

For those interested in the care of infants in groups, Provence (1967) has developed guidelines for infant caretakers to help improve the quality of services to infants in groups with additional suggestions on care practices. Suggestions on how to create a favorable environment in a group situation are also discussed.

CONCLUSION

In concluding this section and the paper, the author suggest that the treatment procedures for very young handicapped children need to be specified in terms of each child's individual needs. What has been described, in the author's opinion, is a broad range of options which should allow the interventionist to choose the needed procedures, techniques, and materials which are appropriate for each childs specific deficits. This approach should produce maximum results with minimum effort. It specific treatment procedures are kept as the goal, rather than approaching the problem at a global level, the individual child will benefit the most from such educational intervention.

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